

## Soil Degradation Problem in South - West Haryana: Strategies for Sustainable Development

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### ABSTRACT

A study on Participatory Rural Appraisal (PRA) was conducted in south-western part of Haryana state. Rank based quotient (RBQ) method was applied for the identification of the field problems. Semi-structured interview method was used for the generation of information. It was found that soil degradation was the major problem, which caused huge loss in agricultural production. Keeping the identified problem in view, various strategies have been presented to rectify the situation for achieving a sustainable agricultural development of the study region.

### INTRODUCTION

Achieving sustainable agriculture has been a major goal of the rural development since Independence. Earlier, agriculture institutions relied on conventional methodologies to gather information about rural people and their resources. Due to flaws in conventional methods, participatory methods of problem identification and development of solutions are recommended. Participatory Rural Appraisal (PRA) is a technique for data generation. In recent times it is applied for managing the natural resources through a holistic comprehension of the ecology of the village/region for sustainable development. In the process, farmers gain confidence and thus are empowered. PRA has been reported to be beneficial by many workers (Sarangi and Kalra, 2002).

An exploratory research was conducted at Rewari district (Haryana) with the following objectives:

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- i) to identify the field problems by participatory approach
- ii) to gain confidence of the farmers and ensure their active participation in development and management works.

### METHODOLOGY

**The PRA technique:** When advising the farmers on new technologies developed through isolated research by the scientific community, they raise many questions to grasp the advantages of the new technologies over their existing practices. Involving the farmers in identifying the field problems and in developing their solutions that are acceptable to the target group is vital for its success (Mishra, 1997). Participation of community has been successfully tried in many individual activities related to natural resources conservation and management (Kala, 1994; Nitant *et al.* 1996). PRA envisages to analyze the farming conditions on the basis of which

appropriate technology may be developed and transferred or the existing technologies may be refined or may even be acquired for sustainable development. In the reported study, Semi-structured interview method was applied for the generation of information. Rank based quotient (RBQ) method (Sabarathnam, 1988) was applied for identifying the problems. Problem prioritization was done based on Village Magnitude Values (VMV). For the most acutely felt problems, remediation options were prioritized, using analytical hierarchical process.

**Estimation of RBQ:** To estimate RBQ, 30 farmers were interviewed. It was calculated using the formula:

$$RBQ = \sum_{i=1}^n \frac{(F_i (n+1-i) \times 100)}{N \times n}$$

where, RBQ = Rank based quotient,  $F_i$  = Frequency of farmers,  $N$  = Number of farmers,  $n$  = number of ranks of all problems and  $i$  = rank given by farmers to the problem.

**Assessment of Magnitude Value of the problem (MVP):** The magnitude value was estimated as:

$MVP = RBQ \times AYLP \times AC$  or  $NA$  or  $NB$  or  $A$  areal extent of the problem

where, RBQ = Rank based quotient, AYLP = Average yield loss in percentage, AC = Area

Table 1. Evaluation of the problem identified at Shahpur village

| Sr. No. | Problem identified           | Rank Given by 30 Farmers |    |     | RBQ  | VMV    | Total Monetary Loss (TML, Rs.) | VMI=VMV*TML   |
|---------|------------------------------|--------------------------|----|-----|------|--------|--------------------------------|---------------|
|         |                              | I                        | II | III |      |        |                                |               |
| 1.      | Soil degradation             | 16                       | 8  | 6   | 77.6 | 5742.4 | 377650                         | 2,168,692,890 |
| 2.      | Wilt disease in chick pea    | 9                        | 14 | 7   | 68.8 | 7915.2 | 235650                         | 1,865,216,880 |
| 3.      | unbalanced use of fertilizer | 5                        | 8  | 17  | 53.1 | 2442.6 | 182650                         | 446,140,890   |

under the crop in the village, NA = Number of animals and NB = Numbers of birds

### RESULTS AND DISCUSSION

The major findings of the study are given in Table 1. Among the researchable problems, soil degradation ranked first, followed by wilt disease in Chickpea and unbalanced use of fertilizers. A huge loss in the area due to the problem forced the researchers and extension workers to find out the combating strategy for sustainable development of the region.

The following strategies could be adopted to overcome the problem:

**Improvement in soil properties:** The study region has loamy sand soil, low rainfall, high evapotranspiration and hot and windy summer seasons. The soils are deficient in organic carbon and available nitrogen, medium to high in available phosphorus and potassium. The soil pH varies from 8.2 to 9.1. Application of farm yard manure, which are easily available and green manuring are cheap and could improve all the physical, chemical and biological properties of the soil. Integrated Pest Management (IPM) may be adopted for reducing the application of pesticides/fungicides. The farmers could be encouraged by the Regional Research Centre of HAU, Hisar and trained by the Krishi Vigyan Kendra and Agricultural department on green manuring, bio-fertilizers, balanced use of fertilizer, and other related aspects.

**Appropriate cropping pattern:** The attitudes of the farmers are still towards cultivation of cash crops. They are neither adopting crop rotation nor the salt tolerant varieties, despite being recommended by the Haryana Agricultural University for the area or the recommendations of the other State Agricultural University for similar areas. The Integrated Plant Nutrient Supply (IPNS) system could be a major approach, which focuses mainly, low to medium external input requirement. Knowledge of the farmers in this respect has to be updated for sustainable agriculture.

**Adoption of diversified agriculture:** The farmers are deficient in knowledge about the diversified agriculture. The components of diversified agriculture i.e., Horticulture, apriary, mushroom cultivation etc., which reduce the cost and generate employment round the year, could be adopted by the farmers. The extension agencies and development departments can play a pivot role by imparting training in concerned areas for the improvement of knowledge and skill of the farmers.

**Judicious use of brackish water:** The area receives scanty rainfall and the groundwater is generally brackish. Farmers lacked knowledge about the water conserving structure/techniques and the possibility of conjunctively using brackish groundwater and surface water for irrigation. The water wasteful flooding is the main irrigation method adopted by the villagers. The farmers need to be educated in judicious use of brackish water for irrigation.

## CONCLUSION

Soil degradation was identified as the top most problem. A suitable strategy could be formulated to maintain the soil fertility. It can be done by improvement in the soil properties,

judicious use of available saline water, adoption of diversified agriculture and appropriate cropping pattern, which needs a massive awareness creation programmes among the farmers. Involvement of state departments, research stations, NGOs, extension agencies and other concerned departments in the awareness creation programme is necessary. To overcome the problem, scientists/researchers may analyse the situation with the active participation of the stakeholders to develop solutions that are acceptable to the farmers.

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## Worth to know about Silent Valley — Our Unique Bio-sphere

Silent Valley National Park, the core of the Nilgiri Biosphere Reserve is one of the most magnificent gift of nature to mankind and a unique preserve of ever green tropical rain forest in all its pristine glory with an almost unbroken ecological history. The extent of degradation is minimal in comparison with other National Parks or Sanctuaries.

*Saravathi Vani*—meaning the forest in the valley as referred to the Mahabharata and the River Kunthi, Gives a mythological dimension to this National Park. This Park has the total area of 89.52 sq.kms in North Eastern Corner of Pallakkad District of Kerala situated between North Latitudes of 11°4' and 11° 13' and East Longitudes of 76° 24' and 76° 29' and its elevation ranges from 900- 2300 metres; This Valley has annual rainfall of 2300 –4400 mm and at the same time another nearby place of Agali (headquarters of Ottapady Block) within a distance of about 40 km in the same district to the North of Silent Valley receives only about 1000 mm annually. The minimum and maximum temperature varies from 8° -29°C.

It rises abruptly to the Nilgiri Plateau in the North and overlooks the plains of Mannarkkad (Kerala) in the South. The River Kunthi descends from the Nilgiri hills above an altitude of 2000 metres and traverses the entire length of the Valley and finally rushing down to the plains through a deep gorge. The Britishers named this as the Silent Valley because there were no Cicadas then.

Unlike the most other Sanctuaries, viewing wild animals in this Park is quite difficult because of the thick vegetation. This contains about 1,000 species of plants; the flowering plants include 966 species belonging to 134 families and 599 genera. Many of these species are rare and endangered. The Silent Valley is a variable treasure house – a gene pool of tropical flora and fauna. The Valley has fair representation of Tiger, Leopard, Wild Dog, Elephant, Gaur, Sambar, Barking Deer, Nilgiri Tahr, Wild Boar, Lion Tailed Macaque, King Cobra, Viper and variety of birds and insects.

The Silent Valley was declared as National Park on November 15, 1984 and became part of the Nilgiri Biosphere on September 18, 1986.

For further details, the Kerala Forest Department (Wildlife Warden, Silent Valley Division, Mannarkkad, Palakkad District. Phone: 04924 222056) may be contacted.

The ecological aspects of Silent Valley may be of interesting to the *Soil Conservationists* for Conservation – Forestry, in similar situations.

*Cheif Editor*

(After his visit to this Valley on 22.1.2005)